

SELECTION PROGRAM FOR ASTRONAUTS FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

by

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A. H. Schwichtenberg, M. D., ~~1888~~

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Ulrich C. Luft, M. D. ~~1955~~

The man eventually called upon to penetrate beyond the atmosphere of the earth in an artificial satellite must have exceptional physical and mental qualifications in order to accomplish his mission successfully. A program was therefore designed for the purpose of selecting a small group of very intelligent, highly motivated and capable test pilots. Out of 100 volunteers, all of whom had academic degrees in engineering and physics, and had accumulated at least 1,500 flying hours as pilots, 32 were taken into closer consideration by the National Aeronautics and Space Administration after a written examination and an extensive personal interview. These men were then subjected to a comprehensive physical examination and a number of dynamic physiological tests under the direction of the Department of Aviation and Space Medicine at the Lovelace

* Description of part of program performed at the Lovelace Clinic and
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foundation and Ciske to ascertain the integrity of individual organ functions at rest, and to establish physical competence in various states of activity. Detailed x-ray studies were made of the internal organs of the chest and of the abdomen, using contrast media and an image intensifier. In addition to conventional hematological, serological and biochemical analyses of blood and urine, total blood volume and hemoglobin were determined, and the total body water measured by means of radiotopes. Archimedes principle was used to determine body density and a new method employed to ascertain radioactive elements in the body. A cardiologist examined each candidate and recorded the electrocardiogram, phonocardiogram and ballistocardiogram at rest, and after exertion. Special procedures were used in the departments of ophthalmology and otolaryngology and neurology to test visual and auditory perception and to record bio-electric activity of the neuromuscular system, and of the brain.

Another phase of the selection program involved rigorous tolerance tests under conditions of acceleration on a centrifuge, exposure to high altitude in a low-pressure chamber, and to extreme heat for several hours. Coordination and performance in the presence of high noise levels and vibration were also observed and recorded. Seven men were finally selected to continue in the space program.

All measurements and observations were documented in detail in an original manner on a series of machine record cards, thus providing a concise but comprehensive record for each individual. This method greatly facilitates reference to any particular item, and permits statistical analyses to be made of the data by an electronic computer.